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SEQUENCE LISTING

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OPITZ, HANS-GEORG

<120> INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN FRAGMENTS  
AND THE UTILIZATION THEREOF

<130> 10496/P65679USO

<140> 09/582,107

<141> 2000-08-10

<150> PCT/EP98/08405

<151> 1998-12-22

<160> 60

<170> PatentIn Ver. 2.1

<210> 1

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 1

Ala Pro Ser Glu Glu Asp His Ser Ile Leu Trp Asp Ala Ile Ser Thr  
1 5 10 15

Tyr Asp Gly Ser Lys Ala Leu His Val Thr Asn Ile Lys Lys Trp Lys  
20 25 30

Glu Pro

<210> 2

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 2

Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro  
1 5 10 15

Pro Pro Ala Arg Thr Pro  
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<210> 3  
 <211> 24  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 3  
 Gly Lys Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu  
           1                          5                          10                          15

Arg Pro Pro Pro Ala Arg Thr Pro  
                           20

<210> 4  
 <211> 35  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 4  
 Gly His Ala Lys Asp Ser Gln Arg Tyr Lys Val Asp Tyr Glu Ser Gln  
           1                          5                          10                          15

Ser Thr Asp Thr Gln Asn Phe Ser Ser Glu Ser Lys Arg Glu Thr Glu  
                           20                          25                          30

Tyr Gly Pro  
                           35

<210> 5  
 <211> 17  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 5  
 Lys Val Asn Gly Ala Pro Arg Glu Asp Ala Arg Pro Val Pro Gln Gly  
           1                          5                          10                          15

Ser

<210> 6  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 6

Leu Thr Gln Ser Lys Phe Val Gly Gly Ala Glu Asn Thr Ala His Pro  
1 5 10 15

Arg Ile Ile Ser Ala Pro Glu Met Arg Gln Glu Ser Glu Gln Gly Pro  
20 25 30

<210> 7

<211> 41

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 7

Pro Gln Ala Gly Thr Ala Arg Pro Gln Asp Val Asn Arg Arg Asp Gln  
1 5 10 15

Gln Arg Asn Pro Gly Thr Ser Thr Thr Pro Ser Gln Pro Asn Ser Ala  
20 25 30

Gly Val Gln Asp Thr Glu Met Gly Pro  
35 40

<210> 8

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 8

Arg Ile Glu Leu Tyr Arg Val Val Glu Ser Leu Ala Lys Ala Gln Glu  
1 5 10 15

Thr Ser Gly Glu Glu Ile Ser Lys Phe Tyr Leu  
20 25

<210> 9

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 9

Gln Gln Glu Leu Asp Gln Val Leu Glu Arg Ile Ser Thr Met Arg Leu  
 1 5 10 15

Pro Asp Glu Arg Gly Pro Leu Glu His Leu Tyr Ser Leu His Ile  
 20 25 30

&lt;210&gt; 10

&lt;211&gt; 24

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 10

Arg Arg Glu Met Glu Asp Thr Leu Asn His Leu Lys Phe Leu Asn Val  
 1 5 10 15

Leu Ser Pro Arg Gly Val His Ile  
 20

&lt;210&gt; 11

&lt;211&gt; 27

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 11

Gln Ser Glu Leu His Arg Ala Leu Glu Arg Leu Ala Ala Ser Gln Ser  
 1 5 10 15

Arg Thr His Glu Asp Leu Tyr Ile Ile Pro Ile  
 20 25

&lt;210&gt; 12

&lt;211&gt; 24

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 12

Arg Arg His Met Glu Ala Ser Leu Gln Glu Leu Lys Ala Ser Pro Arg  
 1 5 10 15

Met Val Pro Arg Ala Val Tyr Leu  
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<210> 13  
 <211> 24  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 13  
 Arg Arg His Leu Asp Ser Val Leu Gln Gln Leu Gln Thr Glu Val Tyr  
           1                  5                  10                  15

Arg Gly Ala Gln Thr Leu Tyr Val  
                   20

<210> 14  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 14  
 Asn Lys Asn Gly Phe Tyr His Ser Arg  
           1                  5

<210> 15  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 15  
 Asp Lys His Gly Leu Tyr Asn Leu Lys  
           1                  5

<210> 16  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 16

Asp Lys Lys Gly Phe Tyr Lys Lys Lys  
1 5

<210> 17

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 17

Asp Arg Asn Gly Asn Phe His Pro Lys  
1 5

<210> 18

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 18

Asp Arg Lys Gly Phe Tyr Lys Arg Lys  
1 5

<210> 19

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 19

Asp His Arg Gly Phe Tyr Arg Lys Arg  
1 5

<210> 20

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 20  
Glu Thr Ser Met Asp Gly Glu Ala Gly Leu  
1 5 10

<210> 21  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 21  
Lys Met Ser Leu Asn Gly Gln Arg Gly Glu  
1 5 10

<210> 22  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 22  
Arg Pro Ser Lys Gly Arg Lys Arg Gly Phe  
1 5 10

<210> 23  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 23  
His Pro Ala Leu Asp Gly Gln Arg Gly Lys  
1 5 10

<210> 24  
<211> 10  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 24

Lys Pro Ser Arg Gly Arg Lys Arg Gly Ile  
 1 5 10

<210> 25

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 25

Arg Ser Ser Gln Gly Gln Arg Arg Gly Pro  
 1 5 10

<210> 26

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 26

Tyr Pro Trp Asn Gly Lys Arg Ile Pro Gly Ser Pro Glu Ile Arg Gly  
 1 5 10 15

Asp Pro Asn

<210> 27

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 27

Asn Pro Asn Thr Gly Lys Leu Ile Gln Gly Ala Pro Thr Ile Arg Gly  
 1 5 10 15

Asp Pro Glu

<210> 28

<211> 19

<212> PRT

<213> Artificial Sequence



<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 28

Asp Lys Tyr Gly Gln Pro Leu Pro Gly Tyr Thr Thr Lys Gly Lys Glu  
 1 5 10 15

Asp Val His

<210> 29

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 29

Asp Arg Lys Thr Gly Val Lys Leu Pro Gly Gly Leu Glu Pro Lys Gly  
 1 5 10 15

Glu Leu Asp

<210> 30

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 30

Asp Lys Tyr Gly Met Lys Leu Pro Gly Met Glu Tyr Val Asp Gly Asp  
 1 5 10 15

Phe Gln

<210> 31

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 31

Asp Arg Met Gly Lys Ser Leu Pro Gly Ser Pro Asp Gly Asn Gly Ser  
 1 5 10 15

Ser Ser

<210> 32  
 <211> 8  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 32  
 Gln Ile Tyr Phe Asn Val Gln Asn  
 1 5

<210> 33  
 <211> 19  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 33  
 His Leu Phe Tyr Asn Glu Gln Gln Glu Ala Arg Gly Val His Thr Gln  
 1 5 10 15

Arg Met Gln

<210> 34  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 34  
 His Leu Phe Tyr Asn Glu Gln Gln Glu  
 1 5

<210> 35  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 35  
 Tyr Ser Met Gln Ser Lys  
 1 5

<210> 36  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 36  
 His Gln Leu Ala Asp Ser Phe Arg Glu  
 1 5

<210> 37  
 <211> 9  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 37  
 His Thr Phe Asp Ser Ser Asn Val Glu  
 1 5

<210> 38  
 <211> 6  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 38  
 Pro Thr Gly Ser Ser Gly  
 1 5

<210> 39  
 <211> 118  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 amino acid sequence

<400> 39  
 Ala Pro Ser Glu Glu Asp His Ser Ile Leu Trp Asp Ala Ile Ser Thr  
 1 5 10 15

Tyr Asp Gly Ser Lys Ala Leu His Val Thr Asn Ile Lys Lys Trp Lys  
 20 25 30

Glu Pro Cys Arg Ile Glu Leu Tyr Arg Val Val Glu Ser Leu Ala Lys  
                   35                  40                  45

Ala Gln Glu Thr Ser Gly Glu Glu Ile Ser Lys Phe Tyr Leu Pro Asn  
           50                  55                  60

Cys Asn Lys Asn Gly Phe Tyr His Ser Arg Gln Cys Glu Thr Ser Met  
       65                  70                  75                  80

Asp Gly Glu Ala Gly Leu Cys Trp Cys Val Tyr Pro Trp Asn Gly Lys  
                   85                  90                  95

Arg Ile Pro Gly Ser Pro Glu Ile Arg Gly Asp Pro Asn Cys Gln Ile  
                   100                  105                  110

Tyr Phe Asn Val Gln Asn  
           115

<210> 40

<211> 123

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
           amino acid sequence

<400> 40

Gly Lys Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu  
       1                  5                  10                  15

Arg Pro Pro Pro Ala Arg Thr Pro Cys Gln Gln Glu Leu Asp Gln Val  
                   20                  25                  30

Leu Glu Arg Ile Ser Thr Met Arg Leu Pro Asp Glu Arg Gly Pro Leu  
           35                  40                  45

Glu His Leu Tyr Ser Leu His Ile Pro Asn Cys Asp Lys His Gly Leu  
       50                  55                  60

Tyr Asn Leu Lys Gln Cys Lys Met Ser Leu Asn Gly Gln Arg Gly Glu  
       65                  70                  75                  80

Cys Trp Cys Val Asn Pro Asn Thr Gly Lys Leu Ile Gln Gly Ala Pro  
                   85                  90                  95

Thr Ile Arg Gly Asp Pro Glu Cys His Leu Phe Tyr Asn Glu Gln Gln  
           100                  105                  110

Glu Ala Arg Gly Val His Thr Gln Arg Met Gln  
           115                  120

<210> 41

<211> 114

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

<400> 41

Gly His Ala Lys Asp Ser Gln Arg Tyr Lys Val Asp Tyr Glu Ser Gln  
1 5 10 15

Ser Thr Asp Thr Gln Asn Phe Ser Ser Glu Ser Lys Arg Glu Thr Glu  
20 25 30

Tyr Gly Pro Cys Arg Arg Glu Met Glu Asp Thr Leu Asn His Leu Lys  
35 40 45

Phe Leu Asn Val Leu Ser Pro Arg Gly Val His Ile Pro Asn Cys Asp  
50 55 60

Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly Arg  
65 70 75 80

Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu Pro  
85 90 95

Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met Gln  
100 105 110

Ser Lys

<210> 42

<211> 102

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

<400> 42

Lys Val Asn Gly Ala Pro Arg Glu Asp Ala Arg Pro Val Pro Gln Gly  
1 5 10 15

Ser Cys Gln Ser Glu Leu His Arg Ala Leu Glu Arg Leu Ala Ala Ser  
20 25 30

Gln Ser Arg Thr His Glu Asp Leu Tyr Ile Ile Pro Ile Pro Asn Cys  
35 40 45

Asp Arg Asn Gly Asn Phe His Pro Lys Gln Cys His Pro Ala Leu Asp  
50 55 60

Gly Gln Arg Gly Lys Cys Trp Cys Val Asp Arg Lys Thr Gly Val Lys  
65 70 75 80

Leu Pro Gly Gly Leu Glu Pro Lys Gly Glu Leu Asp Cys His Gln Leu  
85 90 95

Ala Asp Ser Phe Arg Glu  
100

<210> 43  
<211> 113  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

<400> 43  
Leu Thr Gln Ser Lys Phe Val Gly Gly Ala Glu Asn Thr Ala His Pro  
1 5 10 15  
Arg Ile Ile Ser Ala Pro Glu Met Arg Gln Glu Ser Glu Gln Gly Pro  
20 25 30  
Cys Arg Arg His Met Glu Ala Ser Leu Gln Glu Leu Lys Ala Ser Pro  
35 40 45  
Arg Met Val Pro Arg Ala Val Tyr Leu Pro Asn Cys Asp Arg Lys Gly  
50 55 60  
Phe Tyr Lys Arg Lys Gln Cys Lys Pro Ser Arg Gly Arg Lys Arg Gly  
65 70 75 80  
Ile Cys Trp Cys Val Asp Lys Tyr Gly Met Lys Leu Pro Gly Met Glu  
85 90 95  
Tyr Val Asp Gly Asp Phe Gln Cys His Thr Phe Asp Ser Ser Asn Val  
100 105 110  
Glu

<210> 44  
<211> 119  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

<400> 44  
Pro Gln Ala Gly Thr Ala Arg Pro Gln Asp Val Asn Arg Arg Asp Gln  
1 5 10 15  
Gln Arg Asn Pro Gly Thr Ser Thr Thr Pro Ser Gln Pro Asn Ser Ala  
20 25 30  
Gly Val Gln Asp Thr Glu Met Gly Pro Cys Arg Arg His Leu Asp Ser  
35 40 45

Val Leu Gln Gln Leu Gln Thr Glu Val Tyr Arg Gly Ala Gln Thr Leu  
 50 55 60

Tyr Val Pro Asn Cys Asp His Arg Gly Phe Tyr Arg Lys Arg Gln Cys  
 65 70 75 80

Arg Ser Ser Gln Gly Gln Arg Arg Gly Pro Cys Trp Cys Val Asp Arg  
 85 90 95

Met Gly Lys Ser Leu Pro Gly Ser Pro Asp Gly Asn Gly Ser Ser Ser  
 100 105 110

Cys Pro Thr Gly Ser Ser Gly  
 115

<210> 45

<211> 121

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
 amino acid sequence

<400> 45

Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro  
 1 5 10 15

Pro Pro Ala Arg Thr Pro Cys Gln Gln Glu Leu Asp Gln Val Leu Glu  
 20 25 30

Arg Ile Ser Thr Met Arg Leu Pro Asp Glu Arg Gly Pro Leu Glu His  
 35 40 45

Leu Tyr Ser Leu His Ile Pro Asn Cys Asp Lys His Gly Leu Tyr Asn  
 50 55 60

Leu Lys Gln Cys Lys Met Ser Leu Asn Gly Gln Arg Gly Glu Cys Trp  
 65 70 75 80

Cys Val Asn Pro Asn Thr Gly Lys Leu Ile Gln Gly Ala Pro Thr Ile  
 85 90 95

Arg Gly Asp Pro Glu Cys His Leu Phe Tyr Asn Glu Gln Gln Glu Ala  
 100 105 110

Arg Gly Val His Thr Gln Arg Met Gln  
 115 120

<210> 46

<211> 105

<212> PRT

<213> Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

&lt;400&gt; 46

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Lys Val Asp Tyr Glu Ser Gln Ser Thr Asp Thr Gln Asn Phe Ser Ser
 1              5              10              15

Glu Ser Lys Arg Glu Thr Glu Tyr Gly Pro Cys Arg Arg Glu Met Glu
          20          25          30

Asp Thr Leu Asn His Leu Lys Phe Leu Asn Val Leu Ser Pro Arg Gly
      35          40          45

Val His Ile Pro Asn Cys Asp Lys Lys Gly Phe Tyr Lys Lys Lys Gln
 50          55          60

Cys Arg Pro Ser Lys Gly Arg Lys Arg Gly Phe Cys Trp Cys Val Asp
 65          70          75          80

Lys Tyr Gly Gln Pro Leu Pro Gly Tyr Thr Thr Lys Gly Lys Glu Asp
          85          90          95

Val His Cys Tyr Ser Met Gln Ser Lys
      100          105

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&lt;210&gt; 47

&lt;211&gt; 21

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
peptide

&lt;400&gt; 47

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His Pro Leu His Ser Lys Ile Ile Ile Ile Lys Lys Gly His Ala Lys
 1              5              10              15

Asp Ser Gln Arg Tyr
      20

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&lt;210&gt; 48

&lt;211&gt; 135

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

&lt;400&gt; 48

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Asp Glu Ala Ile His Cys Pro Pro Cys Ser Glu Glu Lys Leu Ala Arg
 1              5              10              15

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Cys Arg Pro Pro Val Gly Cys Glu Glu Leu Val Arg Glu Pro Gly Cys  
                   20                  25                  30  
 Gly Cys Cys Ala Thr Cys Ala Leu Gly Leu Gly Met Pro Cys Gly Val  
                   35                  40                  45  
 Tyr Thr Pro Arg Cys Gly Ser Gly Leu Arg Cys Tyr Pro Pro Arg Gly  
           50                  55                  60  
 Val Glu Lys Pro Leu His Thr Leu Met His Gly Gln Gly Val Cys Met  
       65                  70                  75                  80  
 Glu Leu Ala Glu Ile Glu Ala Ile Gln Glu Ser Leu Gln Pro Ser Asp  
                   85                  90                  95  
 Lys Asp Glu Gly Asp His Pro Asn Asn Ser Phe Ser Pro Cys Ser Ala  
                   100                  105                  110  
 His Asp Arg Arg Cys Leu Gln Lys His Phe Ala Lys Ile Arg Asp Arg  
           115                  120                  125  
 Ser Thr Ser Gly Gly Lys Met  
       130                  135

<210> 49

<211> 109

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
amino acid sequence

<400> 49

Lys Phe Val Gly Gly Ala Glu Asn Thr Ala His Pro Arg Ile Ile Ser  
   1                  5                  10                  15  
 Ala Pro Glu Met Arg Gln Glu Ser Glu Gln Gly Pro Cys Arg Arg His  
           20                  25                  30  
 Met Glu Ala Ser Leu Gln Glu Leu Lys Ala Ser Pro Arg Met Val Pro  
       35                  40                  45  
 Arg Ala Val Tyr Leu Pro Asn Cys Asp Arg Lys Gly Phe Tyr Lys Arg  
       50                  55                  60  
 Lys Gln Cys Lys Pro Ser Arg Gly Arg Lys Arg Gly Ile Cys Trp Cys  
       65                  70                  75                  80  
 Val Asp Lys Tyr Gly Met Lys Leu Pro Gly Met Glu Tyr Val Asp Gly  
           85                  90                  95  
 Asp Phe Gln Cys His Thr Phe Asp Ser Ser Asn Val Glu  
       100                  105

<210> 50  
 <211> 23  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 50  
 His Thr Arg Ile Ser Glu Leu Lys Ala Glu Ala Val Lys Lys Asp Arg  
 1 5 10 15  
 Arg Lys Lys Leu Thr Gln Ser  
 20

<210> 51  
 <211> 30  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 51  
 Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu Arg Pro  
 1 5 10 15  
 Pro Pro Ala Arg Thr Pro Cys Gln Gln Glu Leu Asp Gln Val  
 20 25 30

<210> 52  
 <211> 32  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic  
 peptide

<400> 52  
 Gly Lys Gly Gly Lys His His Leu Gly Leu Glu Glu Pro Lys Lys Leu  
 1 5 10 15  
 Arg Pro Pro Pro Ala Arg Thr Pro Cys Gln Gln Glu Leu Asp Gln Val  
 20 25 30

<210> 53  
 <211> 13  
 <212> PRT  
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 53

Ala Tyr Arg Pro Ser Glu Thr Leu Cys Gly Gly Glu Leu  
1 5 10

<210> 54

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<220>

<221> MOD\_RES

<222> (18)

<223> Variable amino acid

<400> 54

Lys Val Asn Gly Ala Pro Arg Glu Asp Ala Arg Pro Val Pro Gln Gly  
1 5 10 15

Ser Xaa Gln Ser Glu Leu Ile Ile Arg Ala Leu Glu Arg Leu  
20 25 30

<210> 55

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

<400> 55

His Pro Lys Gln Cys His Pro Ala Leu Asp Gly Gln Arg Gly Lys Cys  
1 5 10 15

Trp

<210> 56

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 56

Cys Val Asp Arg Lys Thr Gly Val Lys Leu Pro Gly Gly Leu Glu Pro  
 1 5 10 15

Lys Gly Glu Leu Asp Cys His Gln Leu Ala Asp Ser Phe  
 20 25

&lt;210&gt; 57

&lt;211&gt; 13

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 57

Pro Val Pro Gln Gly Ser Cys Gln Ser Glu Leu His Arg  
 1 5 10

&lt;210&gt; 58

&lt;211&gt; 15

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 58

Thr His Glu Asp Leu Tyr Ile Ile Pro Ile Pro Asn Cys Asp Arg  
 1 5 10 15

&lt;210&gt; 59

&lt;211&gt; 23

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Description of Artificial Sequence: Synthetic peptide

&lt;400&gt; 59

His Thr Arg Ile Ser Glu Leu Lys Ala Glu Ala Val Lys Lys Asp Arg  
 1 5 10 15

Arg Lys Lys Leu Thr Gln Ser  
 20

&lt;210&gt; 60

&lt;211&gt; 138

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic peptide

<220>  
 <221> MOD\_RES  
 <222> (1)..(41)  
 <223> Variable amino acid and this range may encompass up to 41 residues

<220>  
 <221> MOD\_RES  
 <222> (43)..(73)  
 <223> Variable amino acid and this range may encompass 24 to 31 residues

<220>  
 <221> MOD\_RES  
 <222> (77)..(85)  
 <223> Variable amino acid

<220>  
 <221> MOD\_RES  
 <222> (88)..(97)  
 <223> Variable amino acid

<220>  
 <221> MOD\_RES  
 <222> (102)..(125)  
 <223> Variable amino acid and this range may encompass 18 to 24 residues

<220>  
 <221> MOD\_RES  
 <222> (127)..(138)  
 <223> Variable amino acid

<220>  
 <223> See specification as filed for detailed description of substitutions and preferred embodiments

<400> 60  
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
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 20 25 30  
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa Xaa Xaa Xaa Xaa  
 35 40 45  
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 50 55 60  
 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Asn Cys Xaa Xaa Xaa Xaa  
 65 70 75 80

Xaa Xaa Xaa Xaa Xaa Gln Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
85 90 95

Xaa Cys Trp Cys Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
100 105 110

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Cys Xaa Xaa  
115 120 125

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
130 135